

axis cylinder, which may afterward be colored with carmine, is white. Hence it follows that the forms seen in the cord hardened by alcohol, correspond more closely with the normal than those seen after the use of chromic acid.

The conclusions which Fleischl deduces from his investigations are as follows:

The axis cylinder in life is a column of fluid, the volume of which is far more than half of that of the whole fibre.

The medullary matter occupies at most, in the living fibre, the space which after death is taken by the coagulated myeline.

The fluid which makes up the axis cylinder, contains a substance coagulating very readily and differently under different conditions.

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CIRCULATION OF THE BRAIN.—Dr. O. Heubner, in his recently published work, *Die Luetische Erkrankung der Hirnarterien*, gives some interesting details as to the distribution of the cerebral vessels. He operated by injecting the several arterial branches of the brain separately with colored fluids, and observing the results. The principal facts as to the final distribution of the larger vessels in the pia mater are thus summarized:

“The anterior cerebral artery supplies with its first branch of the second order, the network of the pia mater on the under surface of the first frontal convolution, the trigonum olfactorius, and the olfactory nerves; with its branches given off further on its course, it supplies those of the anterior and lateral surfaces of the first frontal convolution; with its corresponding half of the connecting commissure by the posterior branches, the superficies of the two central convolutions and the first parietal convolutions are supplied.

“The first branch of the second order of the middle cerebral artery supplies the third frontal convolution; the second supplies the second frontal convolution; the third the parts of the two central and superior parietal convolutions, which turn to the convexity of the brain; and the fourth supplies the second and third parietal, and part of the three temporal convolutions.

“The posterior cerebral artery supplies the occipital and part of the temporal convolutions.

“The island of Reil is nourished by an arterial network from the pia mater, which is chiefly derived from small lateral twigs of several branches of the arterial fossæ Sylvii.

“In the cerebellum, the regions of the pia mater supplied by single arterial branches, are not nearly so sharply defined as in the cerebrum.”

The small arteries of the network of the pia mater, inosculate freely with each other, according to Heubner.

The arteries of the basal ganglia were also investigated in the same manner, with results not specially different from those of Duret, given in the January number of the JOURNAL for the present year. Dr. Heubner distinguishes in the general circulation of the brain, two separate regions, the basal and the cortical, as described above. In the first region the arteries do not inosculate, but each has its own special tract; in the latter, the inoscultations are free and numerous, as stated.

THE SENSORY NERVES OF THE MUSCLES.—Carl Sachs (*Reichert and Du-Bois Reymond's Archiv*, 1874, No. VI. p. 645-675), in a lengthy paper on this subject, offers the following general conclusions:

1. All objections that have been brought against the doctrine of the sensibility of the muscles, are easily overthrown on theoretic grounds.

2. Reflex contractions can be produced by irritation of the nerve trunk entering a muscle, or the muscle itself. This is evidence of the presence of sensory apparatus in the muscle.

3. The striped muscular fibre, even in an "enervated" state (by curare, analectrotonus, degeneration of the nerves), is still excitable by the induced electric current.

4. All motor nerve-fibres in the muscles of a frog's leg degenerate after section of the anterior roots of the sciatic nerve. A few fibres still remain intact, and degenerate after section of the posterior roots, although more slowly and less noticeably.

5. In the sartorius muscle, it is possible, by a peculiar cut, to show the separate action of the motor and sensory fibres. Irritation of the first causes local contractions; while of the latter, it is without effect.

6. With proper precautions, it is possible to irritate each nerve-fibre of a muscle by itself. We find fibres, irritation of which produces no contraction.

7. The intra-muscular fibres show, at tolerably regular intervals, the "annular strangulations" of Ranvier, the pre-existence of which was proved by their presence in fresh, physiologically active nerve-fibres.

8. The striped muscles of all vertebrates possess sensory fibres, which arise from a relatively small number of medullated fibres, by division. The secondary and tertiary branches, by their long isolated course, the ramificatory manner of their increase, are distinguished from the motor fibres which are always united in bundles and increase by division. They give out soft, non-medullated, nucleated fibrils, frequently anastomosing with each other, and terminating in infinitely fine branches: partly in the connective tissue envelopes of the muscles, partly in the interstitial tissue, and partly in the muscular fibre itself.

FUNCTION OF THE SEMICIRCULAR CANALS.—A. Bornhardt publishes in the *Obl. f. d. Med. Wissensch.*, No. 21, the following conclusions of experiments carried on by himself in Prof. Cyon's laboratory in St. Petersburg:

The principal object of a series of experiments on which I have long been engaged, was the solution of the question, whether the results of the division of the semicircular canals are to be considered as irritative or paralytic phenomena of the *nervi vestibuli*. It seems to me that a notable step in advance is afforded by my own observations, as follows:

1. I have experimentally demonstrated, that the motor phenomena following section of the canals, in the majority of cases, are due to the almost unavoidable accidents of the operation, and are not to be explained by any existing theory.

2. Experimental examination of the Breuer-Mach theory, shows its invalidity. If we take rabbits or doves after the semicircular canals have